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Glucose inhibits human placental GH secretion, in vitro.

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Abstract

Human placenta specifically expresses the GH-V gene leading to the production of placental Growth Hormone (PGH). During pregnancy, PGH levels increase progressively in maternal blood, but its regulation remains unknown. In this study the effect of glucose on PGH secretion by human term placenta was tested, in vitro, by means of two different experimental models: organ culture of villous tissue and primary culture of isolated cytotrophoblasts. PGH was assayed in the culture medium by an immunoradiometric assay using a specific PGH monoclonal antibody. The presence of glucose (25 mmol/L) in the culture medium significantly inhibited ($p < 0.001$) the secretion of PGH by either placental villous explants or by cultured trophoblast cells. This inhibitory effect of glucose on PGH secretion was dose-dependent. More than 50% inhibition being observed with 5.5 mmol/L. In the same conditions, the daily production of hPL and hCG, were unmodified. Furthermore, the glucose-induced inhibition of PGH secretion was more effective when cultured trophoblast cells are differentiated into syncytiotrophoblast. This study demonstrates, for the first time, that among the gestational polypeptide hormones secreted by the human placenta, only PGH secretion is modulated by glucose, suggesting a key metabolic role for this hormone during pregnancy.

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